

ЗВ'ЯЗКИ МІЖ ІНФОРМАЦІЄЮ СИСТЕМИ ОБЛІКУ ТА ЛОГІСТИЧНОЇ СИСТЕМИ ГОСПОДАРЮЮЧОГО СУБ'ЄКТА

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Досліджено спільні риси інформаційної системи бухгалтерського обліку та логістичної системи підприємства. Розкрито організаційно-економічний механізм використання облікових інструментів для підвищення ефективності управління логістичними процесами. Сформульовано окремі підходи до системного використання бухгалтерських інструментів для підтримки логістичних процесів.

Ключові слова: підприємство, діяльність, бухгалтерський облік, інформаційні потоки, логістична система, міждисциплінарні зв'язки

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CONNETIONS BETWEEN THE ACCOUNTING INFORMATION SYSTEM AND THE LOGISTICS SYSTEM OF THE ECONOMIC ENTITY

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The aim of this study is to identify similarities between the accounting information system and the logistics system of an individual economic entity. The background for this type of analysis is provided by the characteristics and the role of the individual information company where the key role regarding the economic information is played by accounting. The presentation of the main characteristics and functions of accounting as well as the definition of the notion and the characteristics of logistics will be followed by the answer to the question about the possibility of using the accounting tools for a more effective management of the logistic processes within the company.

The present study is theoretical and the main research method used for the preparation hereof was a critical analysis of the secondary sources (volume forms and articles) and the primary sources (balance law acts) regarding the theory of information systems, accounting and logistics. The accounting system and the system governing a company's logistics are characterized by certain common features. They primarily include a similar sequence (stages) of the logistical processes and their interdisciplinary and systemic character.

Therefore, there are strong connections between both these systems. This primarily refers to accounting and particularly the management accounting which show a huge potential and the capacity to support the decision-making processes in logistics. The said potentials apply particularly to the adaptation for the needs of the logistics with respect to cost accounting, budgeting and some financial accounting tools (charts of accounts, inventory, financial reporting). The present study was intended to indicate the directions of looking for the possibilities to use accounting tools in order to support logistical processes.

Key words: enterprise, accounting, information flow, logistics system, interdisciplinary connections.

Introduction. The aim of this study is to identify similarities between the accounting information system and the logistics system of an individual economic entity.

The background for this type of analysis is provided by the characteristics and the role of the individual information company where the key role regarding the economic information is played by accounting. The presentation of the main characteristics and functions of accounting as well as the definition of the notion and the characteristics of logistics will be followed by the answer to the question about the possibility of using the accounting tools for a more effective management of the logistic processes within the company.

The present study is theoretical and the main research method used for the preparation hereof was a critical analysis of the secondary sources (volume forms and articles) and the primary sources (balance law acts) regarding the theory of information systems, accounting and logistics.

1. Company Information System. Today organisations have to face up to the rapid pace of changes like never before. Globalisation, and the resulting increased cash flow, revisions of regulations and the provisions of law, new products and branches of industry and new competitors as well as changes in customers' habits and preferences all necessitate quick adaptation of economic entities to the growing knowledge resources. So, apart from the increasing pace of changes in technology, products and markets, the entities have to manage with information overload knowledge surplus.¹

At the same time, there is an upward trend in the demand for information², which is of crucial importance to the proper reaction to changes in the environment and organisation internal structures.³ P. Drucer noticed that: “*managing a company today has to mean managing the future, and in order to do so, we need to manage information that will allow us to take decisions*”.⁴

The information system is a system that allows the system user to transform the input data, using the appropriate procedures and models, to output data. The factor that determines the form of information system must be the aim, or a group of aims, which are supposed to be achieved using the said system. The role of the information system is to combine all elements of management system (planning, decision making, control and conducting)⁵. In other words, company information system should be helpful in solving various issues and making optimal decisions.

Depending on the extent to which the information processes are connected with the management process, there are a number of ways in which information systems are classified⁶.

A very important company information system is the economic information system, namely the ordered group of economic information components together with the processes for collecting, processing and presenting the said information.⁷

The economic information is defined as the documented content that describes future or past economic events, which at the same time defines the impact of the above events on the condition, structure, circulation of economic assets and the sources of their financing as well as the achieved effects of the economic activity. It serves both the analysis and the assessment of an activity and the making of management decisions.⁸

¹ J. Brillman, *Nowoczesne koncepcje i metody zarządzania*, PWE, Warszawa 2002, pp. 29-34; A. Beresińska, *System informacyjny rachunkowości podstawą podejmowania decyzji w zarządzaniu jednostką gospodarczą*, „Zeszyty Teoretyczne Rady Naukowej”, SKwP, 1996, No. 35, pp. 12-13.

² J. Trzcieniecki, *Projektowanie systemów zarządzania*, Wydawnictwo AE w Krakowie, Kraków, 1978, pp. 90-91.

³ Currently, information is considered as the fourth (next to the earth work and capital) production factor, and within information communities it is regarded as energy and matter, the fundamental value that affects the society its interaction (in:) J. Penc, *Zarządzanie w praktyce, menedżerskie myślenie i działanie*, INFOR, Warszawa 1998, p. 46.

⁴ P. F. Drucer, *Skuteczne zarządzanie*, PWE, Warszawa, 1976, p. 39; According to the Polish Standard PN-71-T-01016, information is “any meaning (content) that is assigned to data while meeting the appropriate convention”, (after:) W. Brzezina, *Ogólna teoria rachunkowości*, Wyższa Szkoła Handlu i Prawa, Warszawa 1998, p. 25; J. Kurnal adopts that information is any message conveyed in any manner by any sender to any addressee, (in:) J. Kurnal, *Zarys teorii organizacji i zarządzania*, PWE, Warszawa 1969, p. 236.

⁵ *Zarządzanie*, edited by A. K. Koźmiński i W. Piotrowski, PWN, Warszawa 1996, p. 641.

⁶ J. Turyna, *System informacyjny rachunkowości w podejmowaniu decyzji zarządczych*, Wydawnictwo UW, Warszawa 1997, p. 46

⁷ E. Terebucha, *System informacji ekonomicznej w przedsiębiorstwie*, PWE, Warszawa 1982, p. 47.

⁸ J. Turyna, *op. cit.*, p. 39.

The economic information system is intended to provide the sub-systems with the information that enables: company development, supervising and making sure that the production processes are carried out quickly, providing service to external users of the information and the cooperation with the market actors⁹.

However, the most information that is the most trustworthy and accurate is provided by accounting. It is estimated that the information derived from accounting accounts for about 70 – 80% of the economic information.¹⁰ That is why it is the most important subsystem of economic information, and as such forms the basis of the management system. The role of accounting is visible in all stages of the management process. It is even said that accounting has contributed to the creation of planning in companies, because it was the planning of expenses and income that aroused an interest of the management in the general issues connected with planning¹¹. The role of accounting in planning is particularly observable in the development of theory and practice regarding the forecast costs accounting, budgeting, and the whole management accounting. The accounting information also constitutes the basis of making a range of decisions, operative and strategic, motivated by the economic account (thus centred on a better use of the available means in order to achieve better economic results). The information provided by accounting is also the basis of assessment of activity of individual people and organisational units within a company as well as the whole company. The above assessment can be used in the inspection process and also can become the basis of the appropriate motivation of employees.

2. Accounting as a System. Accounting has a similar interdisciplinary character¹² and therefore it is not clearly defined. Accounting is the most frequently defined as a system for recording economic events that has specific objectives, methods and procedures which allow users to assess and make decisions or also as a specific language of economic activity. It can be stated that accounting is, without a doubt, an information system where the essential part is played by the economic information and the basic purpose of which is to fulfil the user's information needs. Literature has a number of definitions of accounting and it should be noticed that most of them describe it as a system.¹³

Consequently, accounting should be considered as a component (subsystem) encompassing the whole of financial information within the broadly understood company information system which in turn includes all kinds of information on the operation and management of the entire organisation.

The accounting information system is the principal component of the company information system because it:¹⁴

§ Allows managers and external users to obtain the picture of the entire company,

§ Combines other information systems (marketing, human resources, research and development, production, logistics) so that the information generated by the systems can be expressed in financial categories.

The information coming from the accounting system must have the appropriate quality features. In his Treaty on a good work, T. Kotarbiński defines the advantages that should be required from a “good information service” (including accounting). The said advantages include: swiftness, fidelity, proper

⁹ *Informatyka w praktyce. Organizacja systemu informacji gospodarczej w przedsiębiorstwie*, edited by I. Dziedziczaka, A. Nowakowskiego, PWE, Warszawa 1988, p. 18.

¹⁰ H. Ronek, *Rachunkowość jako źródło informacji ekonomicznej* (in:) *Ekonometryczne modelowanie danych finansowo-księgowych*, edited by E. Nowak, M. Urbanek, Norbertinum, Lublin 1995, pp. 94; M. Jączek, K. Sawicki, *Projektowanie systemów informacji ekonomicznej w przedsiębiorstwach handlowych*, PWE, Warszawa 1989, pp. 22-23.

¹¹ W. Brzezina, *op. cit.*, p. 92.

¹² See more on this subject in: Z. Luty, *Rachunkowość jako uniwersalne poznanie*, (in:) *Nauka o rachunkowości na progu gospodarki opartej na wiedzy. Polski sondaż środowiskowy*, edited by A. Karmańska, Oficyna Wydawnicza SGH w Warszawie, Warszawa 2013, pp. 329-337.

¹³ cf. in.: S. Skrzywan, *Teoretyczne podstawy rachunkowości*, PWE, Warszawa 1969, pp. 5, 13; E. Burzym, *Przesłanki i perspektywy standaryzacji i międzynarodowej harmonizacji rachunkowości*, „Zeszyty Teoretyczne Rady Naukowej”, SKwP, 1993, nr 23, pp. 7-8; A. Jaruga, G. Idzikowska, R. Ignatowski, L. Kopczyńska, Z. Owczarek, A. Szychta, E. Walińska, *Rachunkowość finansowa*, RAFIB, Łódź 1995, pp. 8; W. Gos, M. Hass-Symotiuk, T. Kiziukiewicz, K. Sawicki, *Rachunkowość. Zasady prowadzenia po nowelizacji ustawy o rachunkowości*, Ekspert, Wrocław 2001, p. 14; W. Brzezina, *op. cit.*, p. 20.

¹⁴ *Rachunkowość w controllingu przedsiębiorstwa*, edited by E. Nowak, PWE, Warszawa 1996, pp. 34-35.

attention to details, clarity and definiteness. The issue concerning the quality features of accounting is increasingly frequent in literature. The issue is also reflected in the conceptual assumptions for the drawing up and presentation of financial reports recommended both by IASB¹⁵ (International Accounting Standards Board), and FASB¹⁶ (Financial Accounting Standards Board from the USA).

The conceptual assumptions of the financial reporting stress the usability of the information that comprises usefulness and faithful presentation. The information is considered as faithful when it does not contain essential errors, it is impartial (neutral), and fully reflects what it is intended to reflect. The information usability is indicated by its influence on the decisions made by the users. The above brings us to the notion of significance. Information is significant or insignificant where its presence or omitting may affect the decisions that are made.

The supplementary characteristics of the financial information are: intelligibility (how easy information is to understand by its users on the assumption that the users have a minimum knowledge in accounting and economics), comparability¹⁷, timeliness and verifiability.

The obtaining of accounting information, like each organised activity, must be effective in that it has to be characterised by a ratio of positive effects of the system to the incurred expenditures. The starting point to measuring the accounting efficiency is defining the needs of the accounting information users including the needs related to the management of logistic processes.

The primary function of accounting is the information function as the essence of accounting is the processing of data to information. Nevertheless, today accounting is recognised as a tool that assists the management by providing support in planning the future activities (through budgets) with respect to decision-making, the allocation of resources, controlling the activity by recording the events that occurred and comparing them with the budgets.

The contemporary accounting is thus characterised by a duality of objectives where, on the one hand, accounting is intended to reflect the reality (it is the domain of accounting), and on the other, its task is to create the reality by participating in the operation and strategic management process, particularly in planning (the domain of the management accounting). Accounting should provide both retrospective data that will allow settlement and assessment of those who manage the capital and the information necessary for the decision-making process. While the management accounting subsystem is appreciated in larger businesses and its different tools actively support the management processes, it is normally limited to a required minimum in smaller companies and the information required for making decisions largely comes from the financial accounting.

3. Company's Logistic System Description. The American Logistic Association (Council of Logistics Management¹⁸) defined logistics as a process for planning, carrying out and controlling of a working and economically efficient flow of raw materials, materials, finished products, and the appropriate information from the point of origin to the point of consumption in order to meet customer's requirements.¹⁹ One of the most common logistics notions¹⁹ was defined by S. Kummer and J. Weber, who stated that logistics should be understood as an integrated system of managing, organising and controlling

¹⁵ Conceptual assumptions of financial reporting (in:) *Międzynarodowe Standardy Sprawozdawczości Finansowej*, IFRS Foundation, Londyn 2011, pp. A35-A42.

¹⁶ E. A. Hendriksen, M. F. van Breda, *Teoria rachunkowości*, PWN, Warszawa 2002, pp. 149.

¹⁷ The comparability of accounting data is ensured, on the one hand, by the application of the common denominator for the purpose of describing the economic effects and processes related to finances, and on the other hand by a time cohesion and entity transparency of the applied procedures, concepts, forms of financial reports. This allows identification of similarities and differences in the occurrence of economic phenomena among many entities and within the same entity in different time periods.

¹⁸ In 2005 CLM changed its name to Council of Supply Chain Management Professionals (CSCMP). It is one of the most widely known logistical organisations bringing together scientists and logistic practitioners, (after:) <http://www.logistica.pl/slownik>, (05.06.2014).

¹⁹ After: J.J. Coyle, E.J. Bardi, J.C. Langrey Jr, *Zarządzanie logistyczne*, Polskie Wydawnictwo Ekonomiczne, Warszawa 2002, pp. 51-52.

the processes involved in the physical flow of materials and their information conditions in the aspect of optimising the actions and objectives²⁰.

There are many definitions of logistics. However, on a closer analysis of the individual terms, we can single out three important definition aspects of logistics:

1) It is a process involving the flow of tangible properties (raw materials, materials, finished products) and the accompanying information within a company and between companies,

2) It is a concept of managing the processes of the flow of assets based on the integral and systemic consideration of the processes intended to coordinate the said flows in order to minimize their costs,

3) It is a domain of economic knowledge studying the regularities and the effects of the flow of assets and information both in economy and its individual links.

All logistic processes carried out in a company along with the flow of logistical streams and the used facilities make up the company's logistical system.

The concept of logistics as a new field of science and practice was developed relatively quickly and is still changing. In hierarchical order, it can be stated that logistics may be perceived as:²¹

1) Company's functional subsystem designed to ensure the availability of resources (raw materials, semi-finished products, and finished products) as per the customers' needs,

2) The science about coordination and integration of functions in the context of management. It is an expression of systemic orientation, integration, complexity and the coordination of processes of the flow of assets where the optimization along the entire network of creating individual values plays the most important part; in this respect it refers to minimising all irrational actions where functional areas meet within an organisation with potentially conflicting interests and to synchronizing the common fields that will allow the achievement of a benefit;

3) study of management determining all processes relating to the flow of assets in companies (the concept means equalisation of logistics with logistical management), where the logistical approach is taken into account at every stage of solving the issues encountered by the company and at all management levels;

4) integrated management on a market scale (supply chain), which indicates an inter-organisation management oriented towards the processes of the flow of assets (goods and information) along the subsequent stages of creating the added value in accordance with the market demand; supply chains mean the integration of the involved and related entities: suppliers, manufacturers, distribution centres and retailers.

Noticeable changes in the definitions of logistics point to a departure from the approach focused on action in favour of processes that emphasise management processes in the context of processes and systems.

The definition of logistics that is used the most frequently in economic practice in terms of its tasks is the so-called 7R rule, or the 7W rule (in Polish):²²

- right product,
- right quantity,
- right condition,
- right place,
- right time,
- right customer,
- right price.

We ought to notice the role of information in the above-mentioned definitions of logistics and the logistical system. It is included both in the entry to the system and is also generated as a result of the implementation of the logistical processes. In order for the information in logistics that serves both strategic and operational purposes to fulfil the usability requirement, it should be up-to-date,

²⁰ After: F.J. Beier, *Logistyka*, Szkoła Główna Handlowa, Warszawa 2004, p. 21.

²¹ Ł. Sułkowski, *Interdyscyplinarność logistyki*, (in:) *Zarządzanie logistyczne*, edited by K. Kolańska-Morawska, "Przedsiębiorczość i Zarządzanie", Volume XIII, bulletin 16, Społeczna Akademia Nauk, Łódź 2012, pp. 234-235.

²² J.J. Coyle, E.J. Bardi, J.C. Langrey Jr, op. cit., p. 52; The "4C" Rule is also often referred to, which is connected with the customer (demands, costs, comfort of purchase, provided information).

understandable, concise, complete and cost-effective. Only then will it be able to support the implementation of the logistical processes, the system supporting decision-making, and the research and reconnaissance system. Attention should also be paid to the fact that the information relations within the logistical information system have to operate vertically and hierarchically among all organisational units of a company and among all logistic areas.

Logistics is a system that is subject to being affected by a large number of detailed disciplines from military and technical sciences to economic sciences taking particular account of the science of commodities, management and finances.²³

4. Logistics as an Area of Application of Accounting Tools. The logistical system and the accounting information system are characterised by certain similarities. One of them is the way the accounting information processes and the logistical processes are carried out.

The following task sequence is observed in the way the financial accounting information processes are implemented:

- 1) The data on the economic phenomena and economic processes is collected at the entry to the system,
- 2) The processing involves the recording, valuation, settlement and calculation of the collected data,
- 3) At the exit from the system, a product is obtained in the shape of a financial report, and in respect of the management accounting, the product involves a wide range of reports for management needs.

The company logistical system has a similar structure:²⁴

- 1) The actions performed at the entry are supposed to ensure the optimum operation of the system of supply of raw materials and materials,
- 2) The actions in the area of transformation include, above all, making sure the manufacturing process is operating properly.
- 3) The actions at the exit are supposed to ensure swift implementation of the sale process.

The shared features also result from the fact that both the logistical and the accounting system cover all stages of a company's activity. The interdisciplinary and systemic character of logistics and accounting cause that there is not a clear demarcation line between them and many practical and research issues may be encountered in more than one area. The example common areas of interest of accounting and logistics are:²⁵

- Relation with the company objectives,
- Management support,
- Management of reserves,
- Analysis and control of income and expenditures at the stage of supply, production, distribution and recycling,
- Management of financial fluidity through the development of amounts due and liabilities,
- Developing financial result,
- Company's information system.

In the context of relations between logistics and accounting, attention should be paid to the logistics effectiveness aspect²⁶ that points to a potential of logistics that is observable in raising the customer service level and lowering the costs related to movements. The effectiveness measurement is undoubtedly a domain of the accounting information system. The rationalisation of logistical processes that involves, above all, a reduction of logistical costs and increasing the benefits for customers²⁷ is possible by using and adapting the accounting tools, primarily chart of accounts, cost accounting and reporting.

²³ Ł. Sułkowski, op. cit., p. 239.

²⁴ M. Cieciura, *Przesłanki stosowania rachunkowości w obszarze logistyki, (in:) Wykorzystanie narzędzi rachunkowości w logistyce, doświadczenia przedsiębiorstw polskich, niemieckich i białoruskich*, edited by B. Filipiak, Difin, Warszawa 2013, p. 51.

²⁵ Ibidem, p. 52.

²⁶ M. Szymczak, *Internacjonalizacja logistyki: istota i cechy logistyki międzynarodowej, (in:) Internacjonalizacja i globalizacja przedsiębiorstwa i gospodarki*, „Prace Naukowe Akademii Ekonomicznej we Wrocławiu”, No. 930, Wrocław 2002.

²⁷ P. Błaik, *Logistyka. Koncepcja zintegrowanego zarządzania przedsiębiorstwem*, PWE, Warszawa 2001, p. 296.

The logistical processes that occur within a company in the area of supplies, production and distribution can be put in practice as part of the own logistics or foreign logistics by outsourcing the logistical services.²⁸ The decisions regarding the purchase of logistical services outside a company belong to the group of strategic decisions and require the appropriate economic accounting the basis of which is a properly executed account of the logistical costs.

The advancing globalization, the development of IT technology and the development of the concept of managing the logistical networks force companies to implement customer-oriented logistical systems. The above entails the necessity to restructure the existing logistical systems aimed at creating a system ensuring "quick response connected with the ability to reconfigure the reserves quickly and flexibly"²⁹. It seems that the above is an additional factor that reinforces the necessity to look for possibilities of supporting logistics through the accounting system.

The possibilities of using the financial accounting tools for the most part apply to:³⁰

- 1) Adapting the company's charts of accounts,
- 2) Proper assumptions of the systematic cost accounting,
- 3) The use of the inventory process,
- 4) Determining the scope and possibilities of using the information presented in financial reports.

It is obvious that even the best adaptation of the financial accounting tools is not able to fully replace the efficiency of the management accounting and budgeting. The above is basically due to the fact that tools such as cost accounting related to the operation of logistical processes, life cycle cost accounting, target cost accounting, and other recent concepts of cost accounting form the basis of making optimal logistical decisions in modern companies.

Conclusions. The accounting system and the system governing a company's logistics are characterized by certain common features. They primarily include a similar sequence (stages) of the logistical processes and their interdisciplinary and systemic character.

Therefore, there are strong connections between both these systems. This primarily refers to accounting and particularly the management accounting which show a huge potential and the capacity to support the decision-making processes in logistics. The said potentials apply particularly to the adaptation for the needs of the logistics with respect to cost accounting, budgeting and some financial accounting tools (charts of accounts, inventory, financial reporting). The present study was intended to indicate the directions of looking for the possibilities to use accounting tools in order to support logistical processes. The appraisal of the usability of individual accounting tools in the management of logistics requires a separate study.

1. Beier F.J., *Logistyka*, Szkoła Główna Handlowa, Warszawa 2004. 2. Beresińska A., *System informacyjny rachunkowości podstawą podejmowania decyzji w zarządzaniu jednostką gospodarczą*, "Zeszyty Teoretyczne Rady Naukowej", SKwP, 1996, No. 35. 3. Blaik P., *Logistyka. Koncepcja zintegrowanego zarządzania przedsiębiorstwem*, PWE, Warszawa 2001. 4. Brillman J., *Nowoczesne koncepcje i metody zarządzania*, PWE, Warszawa 2002. 5. Brzezina W., *Ogólna teoria rachunkowości*, Wyższa Szkoła Handlu i Prawa, Warszawa 1998. 6. Burzym E., *Przesłanki i perspektywy standaryzacji i międzynarodowej harmonizacji rachunkowości*, "Zeszyty Teoretyczne Rady Naukowej", SKwP, 1993, No.2 7. Cieciora M., *Przesłanki stosowania rachunkowości w obszarze logistyki*, (w:) *Wykorzystanie narzędzi rachunkowości w logistyce, doświadczenia przedsiębiorstw polskich, niemieckich i białoruskich*, edited by B. Filipiak, Difin, Warszawa 2013. 8. Coyle J. J., Bardi E. J., Langrey J. C. Jr, *Zarządzanie logistyczne*,

²⁸ Outsourcing was given a lot of attention in reference books, see: A. Kwiotkowska, Outsourcing jako element strategii działalności naprawczej w przedsiębiorstwie, (in:) *Wybrane elementy zarządzania logistyką w przedsiębiorstwie*, edited by J. Bendkowski, Wydawnictwo Politechniki Śląskiej, Gliwice 2008, pp. 57-69.

²⁹ G. Radziejowska, *Koncepcja restrukturyzacji systemu logistycznego przedsiębiorstwa*, (in:) *Wybrane elementy...*, p. 111.

³⁰ M. Cieciora, *Rachunkowość finansowa jako źródło informacji o procesach logistycznych*, (in:) *Wykorzystanie narzędzi...*, pp. 55-56.

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